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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/530,485	09/27/2005	Didier Frachon	268846US6PCT	5342

22850 7590 01/15/2010
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EXAMINER

WHITTINGTON, KENNETH

ART UNIT	PAPER NUMBER
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2858

NOTIFICATION DATE	DELIVERY MODE
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01/15/2010

ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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Office Action Summary	Application No. 10/530,485	Applicant(s) FRACHON ET AL.	
	Examiner KENNETH J. WHITTINGTON	Art Unit 2858	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 23 December 2009.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 18-36 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 34 is/are allowed.
- 6) ☒ Claim(s) 18-28,30-33,35 and 36 is/are rejected.
- 7) ☒ Claim(s) 29 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 19 September 2008 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on October 29, 2009 has been entered.

Drawings

The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the at least one magnet adhesively bonded to a T-shaped ferromagnetic piece as recited in claim 25, which includes the features of claim 1 which recites the at least one magnet having a cavity opening one a front surface with the magnetosensitive element seated in the cavity must be shown or the feature(s) canceled from the claim(s). The drawings as filed do not illustrate an arrangement having all of the features as recited therein. No new matter should be entered.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure

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number of an amended drawing should not be labeled as “amended.” If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either “Replacement Sheet” or “New Sheet” pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 18, 20, 23-25 and 32 are rejected under 35 U.S.C. 102(b) as being anticipated by Hattori et al. (US4424705), hereinafter Hattori.

Regarding claim 18, Hattori discloses:

a target made of a ferromagnetic material (See Hattori FIG. 4, item 12);

at least one magnet, the target and the magnet defining between one another an air gap (See FIG. 4, item 13);

a magnetosensitive element detecting a magnetic induction caused by a presence of the target and related to the air gap between the target and the magnet (See FIG. 4, note sensor 17), wherein the at least one magnet has a unidirectional magnetization along a direction substantially perpendicular to a front surface of the magnet bounding one edge of the air gap, the magnet having a cavity opening on the front surface of the magnet (See FIG. 4, note magnet 13), the magnetosensitive element being seated in the cavity (See FIG. 4, note sensor 17 in cavity of magnet 13), the target having a geometric configuration such that the induction as a function of the position of the target corresponds to a predefined linear function (See FIG. 4, note this is merely the property of any ferromagnetic target moving in front of the sensor/magnet).

Regarding claim 20, Hattori discloses the target translationally mobile along an axis parallel to an axis of magnetization of the at least one magnet (See FIG. 4).

Regarding claim 23, Hattori discloses the plane of the displacement of the target takes place is included in a plane passing through the center of the magnetosensitive element (See FIG. 4, note structure).

Regarding claim 24, Hattori discloses a ferromagnetic piece adhesively bonded to the back of the at least one magnet (See FIG. 4, item 14).

Regarding claim 25, Hattori discloses the at least one magnet adhesively bonded to a T-shaped ferromagnetic piece (See FIG. 4, items 14 and 16).

Regarding claim 32, Hattori discloses the at least one magnet and the magnetosensitive element are disposed opposite a ferromagnetic membrane configured

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to be deformed under effect of a force applied vertically to a membrane (See FIG. 4 and disclosure related thereto).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 18, 21-23, 26-28, 30, 31, 33, 35 and 36 are rejected under 35 U.S.C. 103(a) as being unpatentable over McDearmon et al. (US2004/0017190), hereinafter McDearmon, in view of Jansseune (US6043646).

Regarding claim 18, McDearmon discloses a position transducer to determine a position of a target comprising:

a target made of ferromagnetic material (See McDearmon FIGS. 1-5, item 2, 4, 6, 10 or 12);

at least one magnet, the target and the at least one magnet defining between one another an air gap (See FIGS. 1-5, items 3 and 5, paragraph 0022);

a magnetosensitive element detecting a magnetic induction caused by a presence of the target and related to the air gap between the target and the at least one magnet, the target having a geometric configuration such that the induction as a function of the position of the target corresponds to predefined linear function (See paragraph 0021).

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However, McDearmon does not explicitly teach the detail of the sensor.

Jansseune teaches a magnet and sensor arrangement for measuring the passing of magnetic teeth comprising a magnet having a unidirectional magnetization along a direction substantially perpendicular to a front surface of the magnet bounding one edge of the air gap, the magnet having a cavity opening on the front surface of the magnet, the magnetosensitive element being seated in the cavity (See Jansseune FIG. 1, note magnet shown and sensor 12 provided therein). It would have been obvious at the time the invention was made to incorporate the sensor arrangement of Jansseune into the apparatus of McDearmon. One having ordinary skill in the art would do so because as noted in McDearmon, its apparatus uses a back biased magnetic sensor, but does not provide the detail (See McDearmon paragraph 0022), thus, one having ordinary skill in the art would look to other back bias sensor arrangements, such as Jansseune, which provide such a sensor that is simply constructed and simple to produce (See Jansseune col. 1, lines 38-40).

Regarding claim 21, this combination teaches the target is rotationally mobile around a shaft perpendicular to an axis of magnetization of the at least one magnet (See McDearmon FIG. 3, note orientation of target 12 and sensor 5).

Regarding claim 22, this combination teaches the target is rotationally mobile around a shaft parallel to an axis of magnetization of the at least one magnet (See McDearmon FIG. 2, note orientation of target 6 and sensor 5).

Regarding claim 23, this combination teaches a plane in which displacement of the target takes place is included in a plane passing through the center of the magnetosensitive element (See McDearmon FIG. 2, note arrangement shown).

Regarding claim 26, this combination teaches the target has a particular or optimized shape, configured to deliver a linear induction as a function of the displacement of the target (See paragraph 0021).

Regarding claim 27, this combination teaches the magnetosensitive element is placed in the cavity in a zone of minimal induction (See Jansseune FIG. note position of sensor within magnet).

Regarding claim 28, this combination teaches the target comprises at least one spiral tooth (See McDearmon FIGS. 1-5, item 2, 4, 6, 10 or 12).

Regarding claim 30, this combination teaches a maximum measurable angular travel is close to 360° (See all FIGS. of McDearmon and structures of sensor arrangements).

Regarding claim 31, this combination teaches the target has a shape configured to generate a variation of thickness of the air gap that is a function of a position relative to the at least one magnet (See McDearmon FIGS. 1-5, item 2, 4, 6, 10 or 12).

Regarding claim 33, this combination teaches a position transducer for a camshaft or crankshaft having the features of claim 21 (See discussion of claim 21 above).

Regarding claim 35, this combination teaches the induction as a function of the position of the target is a linear function across the entire maximum measurable angular or linear travel (See paragraph 0021).

Regarding claim 36, this combination teaches a maximum measurable angular travel is 360°, and the induction as a function of the position of the target is a linear function across the entire maximum measurable angular travel (See paragraph 0021).

Claim 19 is rejected under 35 U.S.C. 103(a) as being unpatentable over McDearmon in view of Jansseune as applied to claim 18 above, and further in view of Vig et al. (US5781005), hereinafter Vig. Regarding this claim, the noted combination teaches a rotary position sensor wherein the target is rotationally moved passed the at least one magnet such that the tooth of McDearmon passes the magnet perpendicularly (See FIGS. 1-5 of McDearmon), but not a translational movement. Nonetheless, ordinary skill and Vig teach using a linear motion sensor wherein the rate of passing is determined linearly in lieu of rotary motion (See Vig col. 1, lines 27-34). One having ordinary skill in the art would make such a linear position sensor using the teachings of the rotary position sensing apparatus in order to measure linear positional changes. Furthermore, such a change from using basic teaching applicable to either rotary or linear position sensing apparatus is routine skill in the art as noted in the cited portion of Vig.

Allowable Subject Matter

Claim 34 is allowed. It is allowed for those reasons outlined in the Final Office Action mailed December 17, 2007.

Claim 29 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. The following is a statement of reasons for the indication of allowable subject matter: regarding this claim, the prior art does not show or teach three spiral teeth positioned at 120 degrees to each other to produce the predefined linear function as recited in the claim and in combination with the other features of the claim.

Response to Arguments

Applicant's arguments with respect to most of the claims have been considered but are moot in view of the new ground(s) of rejection.

However, those rejections applying Hattori and McDearmon will be addressed herein. Particularly of note is that Applicants presumably assert that Hattori does not disclose a predefined linear function. Initially, it is noted that the claims only require that the function only "correspond" to a predefined linear function. Thus, any function that is capable of "corresponding" can meet this claim limitation, either by a simple transfer equation or an arithmetic operator. The proximity sensor arrangement of Hattori would meet such a "corresponding" to a linear function since its proximity arrangement would provide a one-to-one arrangement of flux versus distance relationship.

Furthermore, in the output of Hattori, though not discussed in Hattori, the output of the sensor would be related to the proximity of the ferromagnetic diaphragm. This situation is similar to FIG. 16 of Applicants invention, wherein a magnet contains a sensor in a cavity and monitors movement of a planar ferromagnetic diaphragm that is opposed to the magnet. If at least Applicants apparatus provides or "corresponds" to a linear output with a planar diaphragm in this manner, the sensor in the analogous apparatus of Hattori would similarly provide such a linear output.

Applicants also assert that McDearmon does not teach a linear predefined function because it notes that the output may or may not be linear. Applicants have focused on the "may not" portion. However, because this phrase includes the situation wherein the output is linear, then McDearmon teaches this feature.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to KENNETH J. WHITTINGTON whose telephone number is (571)272-2264. The examiner can normally be reached on Monday-Friday, 8:00am-4:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick Assouad can be reached on (571) 272-2210. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Kenneth J Whittington/
Primary Examiner, Art Unit 2858

kjw